INDEX TO THE VIERTELJAHRSSCHRIFT DER ASTRONOMISCHEN GESELLSCHAFT, BY GENERAL ALEXIS VON TILLO.

A very much-needed index to the first twenty-five volumes of the V. J. S. *der Astronomischen Gesellschaft* has just been made by General VON TILLO, and issued by the Society.   E. S. H.

ELEMENTS OF COMET *PERRINE*, 1896 *a.*

From Mr. PERRINE's observation at the time of discovery, the morning of February 15th, and my observations of the mornings of February 20th and 25th, I have computed the following elements of Comet 1896 *a:* —

$$T \; 1896 \; \text{Jan.} \; 31.77508 \; \text{Gr. M. T.}$$

$$
\left.
\begin{array}{llll}
\omega & 358^\circ & 21' & 24''.7 \\
\Omega & 208 & 52 & 26 \;.1 \\
\pi & 207 & 13 & 50 \;.8 \\
i & 155 & 45 & 37 \;.2
\end{array}
\right\} \; 1896.0.
$$

$$\log q \; 9.768844.$$

$$(O-C): \quad \Delta\lambda' \cos \beta' = + \; 2''.0; \quad \Delta\beta' = - \; 2''.0;$$

$$\frac{\tan (\lambda' - \Theta')}{\sin \beta'} = - \; 1.066.$$

An ephemeris has been computed from these elements, and the observations made in March show the comet to be following it very closely. The brightness of the comet is diminishing rapidly, and it will probably not remain visible more than two or three months longer.   W. J. HUSSEY.

March 17, 1896.

CHARTS OF FAINT STARS FOR MAGNITUDE COMPARISON (THIRD SERIES).

The adjoining four small charts close the set of twelve, as originally planned for the thirty-six-inch telescope, furnishing one at about each two hours of Right Ascension. Their completion has been delayed, owing to the demands of other work, on the relatively few good nights that occur at the season of year when these are in position. In order to finish them, some of the observing has been done at rather large zenith distance; one of them is at fifty degrees zenith distance when on the meridian.

Still the charts represent the reach of the thirty-six-inch tele-

scope under average conditions; on the best nights, and close to the zenith, undoubtedly some few additional stars would be shown. As in the series previously published,* the charts follow some bright star by two minutes, and are four minutes long in Right Ascension by ten minutes wide in Declination, extending five minutes each side of the bright star, north and south.

These are located :

			R. A.	Decl.
I	follows	α *Piscium*	1^h 56^m	+ 2° 15
II	"	γ *Eridani*	3 53	− 13 49
III	"	ε *Orionis*	5 31	− 1 16
IV	"	ε *Hydræ*	8 41	+ 6 49

The set of charts was first prepared at the Harvard College Observatory, and stars down to the fifteen magnitude are represented by the observing done there.

With the twenty-six-inch telescope at Washington some additional stars were plotted, and in one of the charts the sixteenth magnitudes are completely represented.

With the thirty-six-inch telescope the greater proportion of stars added have been of the lowest class, sixteenth and seventeenth magnitudes, but a number have been classed in the next higher, fourteen and fifteen.

In this series of four, two hundred new stars have been plotted with the thirty-six-inch telescope, and one hundred and seventy-four have been identified of those previously noted. They fall, respectively, within the following classes:

1	9 magnitude and brighter,	6 stars
2	10 and 11 magnitude,	33
3	12 and 13 "	54
4	14 and 15 "	118
5	16 and 17 "	163
	and one nebula.	374 stars

These classes, used in the charts previously published, may be taken to represent the reach of telescopes of one, three, six, fifteen, and thirty-six inches.

The combined set of twelve charts covers an area of two square degrees. Since they are spaced at nearly equal intervals, in a girdle about the sky, they probably present, roughly, something
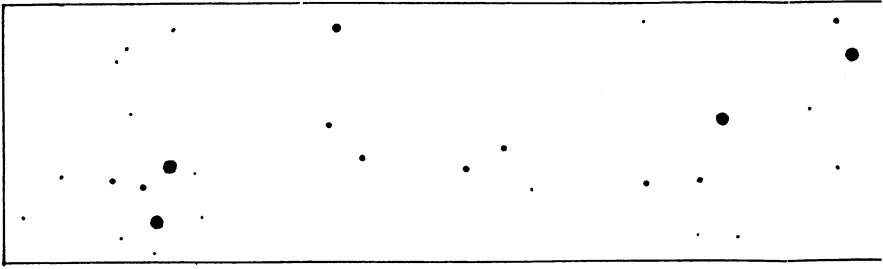
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* *A. S. P.*, Vol. V, 32, and Vol. VI, 37.
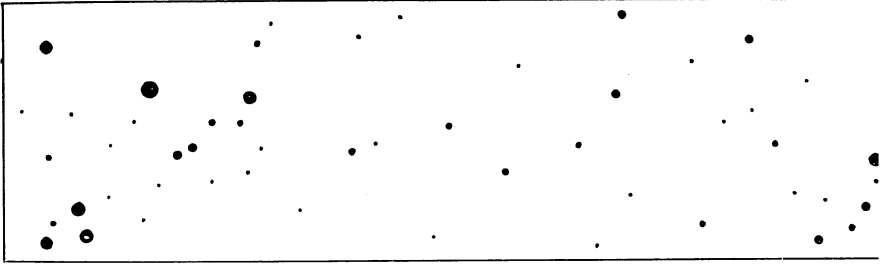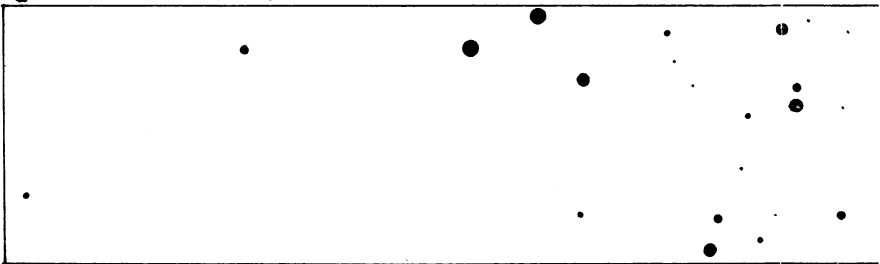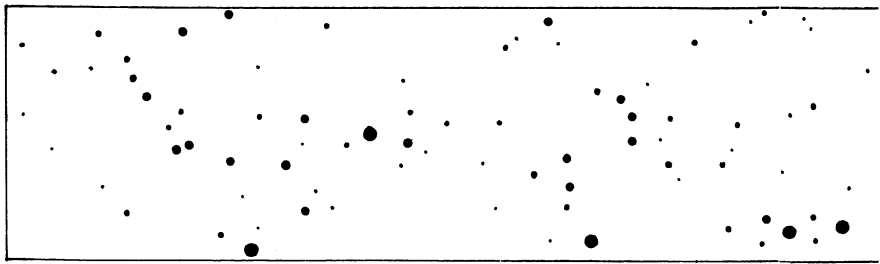
6^m Following   ∝ PISCIUM .

E

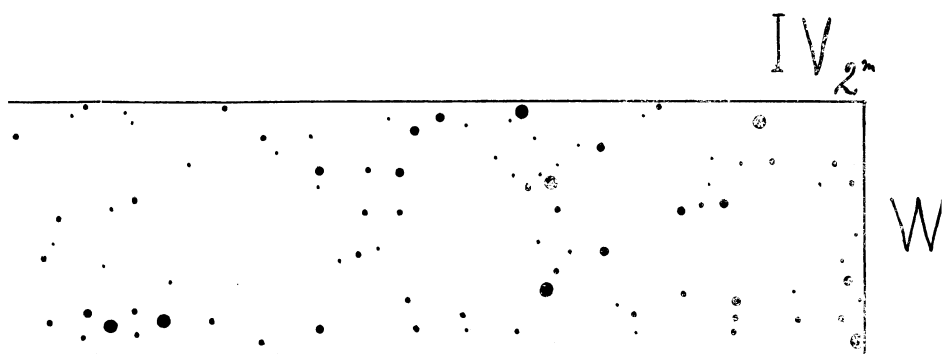6^m Following   γ ERIDANI .

E

6^m Following   ε ORIONIS .

E

6^m Following   ε HYDRAE .

E

.11   12.13   14.15   16.17

N

I 2^m

0 — NEB.
W

II 2^m

W

III 2^m

W

IV 2^m
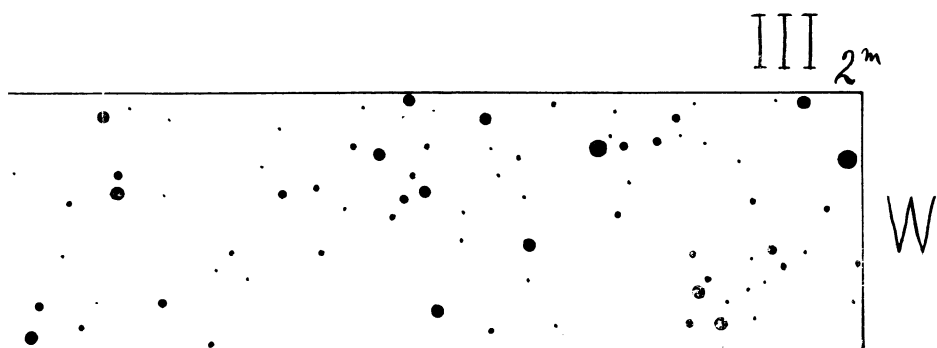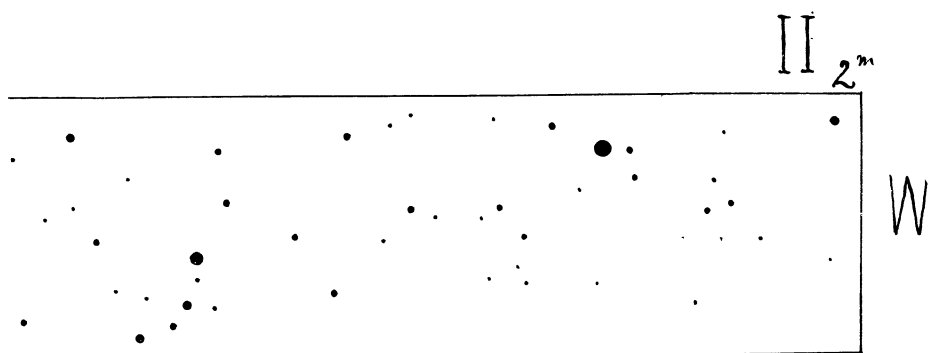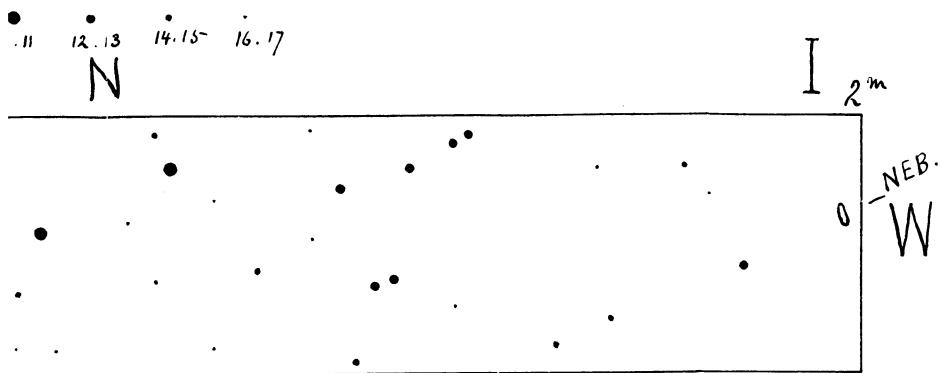
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R.H. TUCKER JR. DEL.
1896.

of the general distribution of the stars. They present a great variety, ranging in number of stars from 29 to 459; the average being 116.

In some, there are evident tendencies towards clustering; others have a fairly uniform distribution. In III of this latest series, there is a sudden diminution in the last two minutes, forming a decided blank, a feature of the sky which is familiar to all who have had large regions under continuous observation.

The total number of stars charted with the thirty-six-inch telescope is 1396; about 700 to the square degree. While this is not sufficient basis for expanding to the whole sky, it may serve to give an idea of proportion. The total count gives the distribution in classes, as above:

1	16 stars
2	91
3	192
4	327
5	770

The total number of stars included, down to each type, is a test that has been quite thoroughly made for the brighter part of the magnitude scale. The various Uranometries and the several sections of the *Durchmusterung* have furnished the material for such count.

For these faint stars, in this limited area,

1 per cent.	are	9	magnitude,	or	brighter.
8 "	"	" 11	"	"	"
21 "	"	" 13	"	"	"
45 "	"	" 15	"	"	"

With 700 stars to the square degree, there would be about

29 million	to	the	17	magnitude.	
13 "	"	"	15	"	
6 "	"	"	13	"	
2 "	"	"	11	"	

and 300,000 of the 9 magnitude.

These figures are not far from estimates which place the ninth-magnitude stars between two and three hundred thousand; while the estimate of the photographic chart to the eleventh magnitude is about two millions.

The ratio of increase in numbers, which has been found to hold good down to the ninth magnitude, breaks down here, as

the fainter stars are included. Thus, expressing the total number of stars down to the magnitude m inclusive, by the well-known form $a\ b^m$, b has been found to be 3.9 down to the ninth magnitude.

It is also true for the lower grade of the Cordoba *Durchmusterung*, as that includes a large proportion below the tenth magnitude. In this count of fainter stars, b drops at once below 3: and averages 1.5 from 11 magnitude to 17 magnitude. If the ratio in the number of fainter stars fails to increase, it would appear to indicate that our telescopes are reaching the confines of the stellar system. And that in place of extending to greater depths, the smaller or less bright objects, intrinsically, within the limits already explored, are being brought within our ken. No hypothesis of this character admits of proof at present. If the stars are, in general, uniformly distributed, and if their brightness depends mainly upon their distance from us, the number of fainter stars should keep up the ratio.

But we know that the brightest stars are not universally the nearest; and uniform distribution cannot be proved. There is undoubtedly great variety of size, and probably of intrinsic brightness. Should a count of faint stars, based upon more complete material, fail to show more of an increase in number than could fairly be assumed as due to the variety of size and brilliancy of the stars in regions already known, it would seem probable that we are penetrating no farther into space.

<div align="right">R. H. TUCKER.</div>

15-INCH REFRACTOR FOR THE OBSERVATORY OF KOENIGSBERG.

A private letter from Professor HERMANN STRUVE, Director of the Observatory, notifies that there is a prospect that the Koenigsberg Observatory may soon possess a refractor of fifteen inches aperture. E. S. H.

SUSPENSION OF THE "AMERICAN METEOROLOGICAL JOURNAL."

The editors of the *American Metereological Journal* announce that the publication will cease with the number for April, 1896, (which completes volume XII). The *Journal* has been carried on at a loss (which has been borne by the editors) and the present